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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/748,741

12/30/2003

Mark John Kocher

CIT-4

7528

7590

02/17/2006

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EXAMINER

PHAM, THOMAS K

ART UNIT

PAPER NUMBER

2121

DATE MAILED: 02/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/748,741

Applicant(s)

KOCHER ET AL.

Examiner

Thomas K. Pham

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 29-44 is/are allowed.
- 6) ☒ Claim(s) 1-6, 18-22 and 45 is/are rejected.
- 7) ☒ Claim(s) 7-17, 23-28 and 46-49 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

First Action on the Merits

1. Claims 1-49 of U.S. Application 10/748,741 filed on 12/30/2003 are presented for examination.

Quotations of U.S. Code Title 35

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim Rejections - 35 USC § 102

6. Claims 1, 5, 6, 18, 22 and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,765,315 ("Hammerstrom").

Regarding claim 1

Hammerstrom teaches a method of controlling a multivariable system comprising:

- monitoring a plurality of control variables of interest in the system (see Col. 2 lines 62-63);
- selecting one of the control variables for regulation control and regulating the selected control variable relative to a desired setpoint while continuing to monitor the remaining ones of the control variables (see Col. 2 line 65 to Col. 3 line 10); and
- selectively switching regulation control over to one of the remaining ones of the control variables and regulating that control variable relative to a desired setpoint if that control variable is detected as exceeding an allowed value (see Col. 3 lines 28-35).

Regarding claim 18

Hammerstrom teaches a multivariable control apparatus to control a multivariable system, the apparatus comprising:

- one or more monitoring circuits configured to generate error signals relative to desired setpoints for a corresponding plurality of control variables of interest in the system (see Col. 2 lines 62-65); and
- a control circuit configured to select one of the control variables for regulation control and regulate the selected control variable based on the corresponding error signal (see Col. 2 line 65 to Col. 3 line 10), and

Art Unit: 2121

- further configured selectively to switch regulation control over to any of the remaining ones of the control variables responsive to detecting that any one of the remaining control variables is exceeding an allowed value (see Col. 3 lines 28-35).

Regarding claim 45

Hammerstrom teaches a computer readable medium storing a computer program for controlling a multivariable system, the computer program comprising:

- program instructions to monitor a plurality of control variables of interest in the system (see Col. 2 lines 62-63);
- program instructions to select one of the control variables for regulation control and regulate the selected control variable relative to a desired setpoint while continuing to monitor the remaining ones of the control variables (see Col. 2 line 65 to Col. 3 line 10);
and
- program instructions to selectively switch regulation control over to one of the remaining ones of the control variables and regulate that control variable relative to a desired setpoint if that control variable is detected as exceeding an allowed value (see Col. 3 lines 28-35).

Regarding claims 5 and 22

Hammerstrom teaches defining an order of control precedence that determines the particular control variable selected for regulation control if two or more of the control variables are detected as exceeding their allowed values (see Col. 3 lines 1-10).

Regarding claim 6

Art Unit: 2121

Hammerstrom teaches designating a particular one of the control variables as a default regulation variable, and assigning a lowest control precedence to the default regulation variable (see Col. 4 lines 21-43).

Claim Rejections - 35 USC § 103

7. Claims 2-4 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,765,315 (“Hammerstrom”) in view of U.S. Patent No. 6,901,300 (“Blevins”).

Regarding claims 2 and 19

Hammerstrom does not specifically teach storing one or more parameter values for each of the control variables, and configuring a control circuit to use the stored parameter values corresponding to a particular one of the control variables where that particular control variable is selected for regulation control.

However, Blevins teaches an advance control system to provide control for multi-variable processes includes storing one or more parameter values for each of the control variables, and configuring a control circuit to use the stored parameter values corresponding to a particular one of the control variables where that particular control variable is selected for regulation control (see Col. 17 lines 54-66) for the purpose of controlling a set of process parameters and control logic responsive to a plurality of inputs to produce control signal at each of plurality of outputs (see Col. 4 lines 15-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the storing and configuring of parameter values of Blevins with the system of Hammerstrom because it would provide for the purpose of controlling a set of process

Art Unit: 2121

parameters and control logic responsive to a plurality of inputs to produce control signal at each of plurality of outputs.

Regarding claims 3 and 20

Blevins teaches the control circuit comprises a PID controller, and wherein the stored parameter values for each control variable comprise at least one of a proportional gain term, an integral gain term, and a derivative gain term (see Col. 6 lines 19-32).

Regarding claims 4 and 21

Blevins teaches providing an individual control loop for each control variable, and closing the control loop corresponding to the selected control variable through the PID controller (see Col. 5 line 59 to Col. 6 line 5).

Allowable Subject Matter

8. Claims 7-17, 23-28 and 46-49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claims 29-44 are allowed.

Reasons for Indicating Allowable Subject Matter

10. The following is an examiner's statement of reasons for the indication of allowable subject matter:

While Hammerstrom (U.S. Patent No. 6,765,315) discloses a control software users control multiple control variables to track and control operation of a control circuit. Each

Art Unit: 2121

variable can be configured to operate freely and independently with no constraints, within a specified limits, maintain a specified set point, or to track variable analog input signal. The circuit can operate as the interface between two DC power systems. The DC-DC converter can be configured to perform maximum power point tracking as long as the control variables stay within an allowable range. Hammerstrom does not teach a first power flow device to control power flow between an electrical energy storage device (EESD) associated with the system and a dc bus included within the system; a reverse blocking circuit to couple an alternative energy generation device (AEGD) to the dc bus and prevent reverse current flow from the dc bus into the AEGD; an ac inverter to generate ac power from dc power supplied by the dc bus; and a multivariable control circuit to monitor a set of control variables comprising two or more of an EESD voltage, an EESD current, an AEGD current, and a dc bus voltage.

And Weimer et al. (U.S. Patent No. 5,982,156) discloses an open loop control arrangement for an electrical energy flow-controlling circuit coupling the varying terminal voltage of an energy storing capacitor to a fixed voltage direct current aircraft energy supply bus in order to supplement bus voltage transients. A plurality of electrical energy storage devices located at selected distributed locations disposed throughout the aircraft and connected locally to said array of electrical bus conductors at each of the selected distributed location. The electrical energy storage devices including a super capacitor element and an energy coupling electronic circuit communicating a transient flow of electrical energy from the super capacitor to the electrical bus conductors. Weiner et al. does not teach a first power flow device to control power flow between an electrical energy storage device (EESD) associated with the system and a dc bus included within the system; a reverse blocking circuit to couple an alternative energy

Art Unit: 2121

generation device (AEGD) to the dc bus and prevent reverse current flow from the dc bus into the AEGD; an ac inverter to generate ac power from dc power supplied by the dc bus; and a multivariable control circuit to monitor a set of control variables comprising two or more of an EESD voltage, an EESD current, an AEGD current, and a dc bus voltage.

Neither of these references taken either alone or in combination discloses a multivariable control apparatus for controlling an alternative energy system having all the claimed features of applicant's instant invention, specifically including: a first power flow device to control power flow between an electrical energy storage device (EESD) associated with the system and a dc bus included within the system; a reverse blocking circuit to couple an alternative energy generation device (AEGD) to the dc bus and prevent reverse current flow from the dc bus into the AEGD; an ac inverter to generate ac power from dc power supplied by the dc bus; and a multivariable control circuit to monitor a set of control variables comprising two or more of an EESD voltage, an EESD current, an AEGD current, and a dc bus voltage. Also, there is no motivation to combine the Hammerstrom reference with the Weimer reference to meet these limitations.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner *Thomas Pham*; whose telephone number is (571) 272-3689, Monday - Thursday from 6:30 AM - 5:00 PM EST or contact Supervisor *Mr. Anthony Knight* at (571) 272-3687.

Any response to this office action should be mailed to: **Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450**. Responses may also be faxed to the **official fax number (571) 273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas Pham
Patent Examiner

A handwritten signature in black ink, appearing to read 'Thomas Pham', with a long horizontal flourish extending to the right.

February 13, 2006